# Leveraging the Sentinel System for COVID-19

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# Infrastructure and Data Considerations

- Information urgency: need for near real-time data

- Identification of infection status and COVID-19 cohort definitions
  - Capture of lab results, type of lab, shifting coding practices across time and location

- Identification of exposure details
  - Registries, claims, pharmacies, inpatient, medical records, other

- Competing demands on data and scientific partners
  - Multiple organizations making demands on a small group of critical partners

- Coordination and collaboration across organizations will be critical

# Rapid COVID-19 Sentinel Distributed Database

- Uses Sentinel Common Data Model Core tables + COVID-19 Lab Results
- Freshest feasible data
  - Data from 1/1/2018 – present
- Data curation: Model compliance data quality assurance
- Allows use of standard querying tools for rapid querying and response

Rapid COVID-19 Sentinel Distributed Database
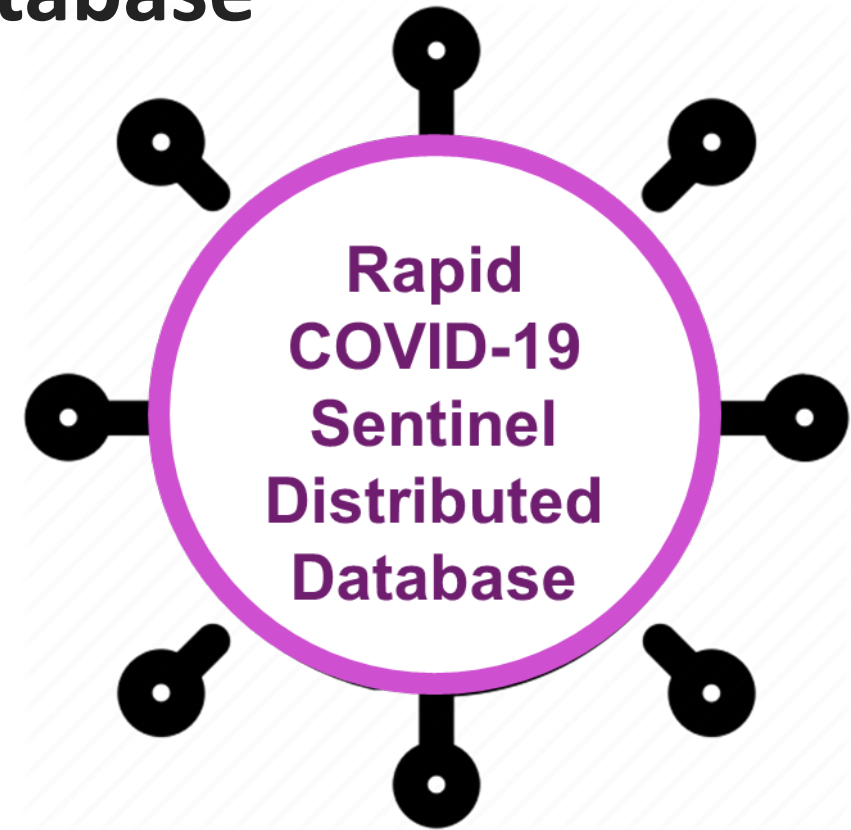
# Near-Real Time Data with Current Partners: Complexity and Experience

- At any point in time the data are "incomplete"
  - Claims data typically arrives in multiple streams with different data lags
  - Unadjudicated claims or open claims are subject to revision
  - EHR data is not immune: Post-discharge updates v. within-hospitalization updates
  - "Daily" feeds can capture differential diagnoses or other data subject to change

- At any point in time exposures will be more completely captured than outcomes
  - Bias depends on study design and whether data delays are non-differential
  - Analytic solutions exist but they do not apply to all designs

- Sentinel has substantial experience with existing data partners in addressing data lag and uncertainty issues and with the methodologic approaches for addressing them

# New Partnerships Enable Rapid Querying of Near Real-Time EHR Data

- Interactive dashboards show geographic and temporal patterns in inpatient drug use
  - Up to 120 critical drugs including:
    - Antimicrobials
    - Dexamethasone
    - Remdesivir
- COVID-19 hospitalization rates
- COVID-19 patient characteristics
- Co-morbidities and complications
- Rapid and interactive querying of querying of EHR data

# Validation of Hospitalized COVID-19 Detected from Claims-Based Algorithms

- Validation of hospitalized COVID via positive laboratory diagnostic tests to assess the performance of ICD-10 diagnosis code-based algorithms for COVID-19 patient identification
- Algorithms that perform well may be used by Sentinel and others to identify hospitalized cases when lab data are unavailable or incomplete
- Study included 5 data partners, 5 different algorithms, and 3 assessment periods
- Positive predictive value (PPV) and sensitivity similar across algorithms
  - Simplest algorithm, ICD-10 code U07.1 alone, performed similarly to broadest algorithm (5 coronavirus codes including U07.1).
  - Across all periods, PPV was ~86% for all algorithms